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REMARKS

In the Office Action, the Examiner noted that claims 1-18 are pending in the application, though claims 1-5 and 8-10 are withdrawn from consideration, and claims 6, 7, and 11-18 are rejected. By this amendment, claims 11 and 15 have been amended, and claims 19 and 20 have been newly added. Thus, claims 6, 7, and 11-20 are now pending in the application. The Examiner's rejections are traversed below.

REJECTION UNDER 35 U.S.C. § 102(e)

The Examiner has rejected claims 11-18 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,137,893 to Michael et al. (hereinafter, "Michael"). The Examiner maintains the rejection citing Figures 1A-1D of Michael for teaching at least one of the blades having a non-zero skew and non-zero spiral. In his comments, the Examiner explains that in Michael, the position of the blades implicitly result in the non-zero spiral and non-zero skew limitations of the present invention.

The Applicant has amended claims 11 and 15 to clarify the non-zero spiral and non-zero skew limitations by requiring that the boundary contour of at least one of the plurality of blades represents a non-zero spiral (claim 11) or non-zero skew (claim 15). The distinction being that it is the shape of the blades that has spiral or skewed features, not the relative position of the plurality of blades.

The targets disclosed by Michael are exactly those described as prior art in the background of the Applicant's specification. The targets disclosed by Michael are "simple polygons such as squares and diamonds ... that are almost impossible to manufacture." The prior art cited by the Examiner, however, does not teach or disclose rendering targets on an object characterized by a fan shape with at least one of a plurality of blades having a contour boundary representing a non-zero spiral or a non-zero skew. Targets rendered with non-zero spiral and/or non-zero skew boundary contours, as claimed by Applicant, eliminate straight radial features that result in grid degeneracy and size self-similarity when searching for the target so as to provide a pose of the object.

Accordingly, with respect to claims 11 and 15, as amended, the Applicant respectfully asserts that the rejection has been overcome, and the claims are at least

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allowable. With respect to claims 12-14, and 16-18, that depend from claims 11 and 15 respectively, for reasons analogous to those argued above, the dependent claims are also allowable.

REJECTION UNDER 35 U.S.C. § 103(a)

The Examiner has rejected claims 6 and 7 under 35 U.S.C. § 103(a) as being unpatentable over Michael and further in view of U.S. Patent 5,125,035 to McCarthy (hereinafter, "McCarthy"). The Examiner cites Michael for teaching the concept of rendering a target characterized by a fan shape on an object and providing a pose of the object. McCarthy is cited ostensibly for teaching the Applicant's claimed limitation of including at least one hole on at least one of the plurality of blades. Applicant respectfully asserts that the combination of Michael and McCartney does not render the claimed subject matter obvious to one of ordinary skill in the art.

McCarthy teaches a machine vision inspection system that determines the true position of cooling holes in the manufacture of turbine blades. The teachings of McCarthy disclose a system and method of determining the deviation from the actual or true position of a hole from the expected or desired position. Throughout the McCarthy disclosure, the holes of the turbine blades are the actual objects of inspection, and nothing in McCarthy suggests that the features in an image characterizing a hole can be advantageous when included in an alignment target. In other words, the holes described in the teachings of McCarthy are associated with the actual object of inspection, and not associated with a target, as claimed by Applicant. Therefore, there is nothing in the combined teachings of Michael and McCarthy to suggest the combination of a "fan-shaped" target including "holes."

Regarding claim 6, Applicant claims the step of rendering a target on the object, the target characterized by a fan shape, having a plurality of blades, with at least one of the plurality of blades including at least one hole. Viewing Applicant's claimed invention as a whole, including at least one hole in at least one of the plurality of blades of a target serves to improve the step of searching for the target so as to provide a pose of the object onto which the target is rendered. Both Michael and McCarthy, individually, or in combination, fail to teach or suggest that hole features in a target serve to improve the

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step of searching for a target so as to provide a pose of the object. Merely combining the teachings of Michael with the system and method for locating holes in an object as taught by McCarthy, fail to demonstrate that the invention, as claimed by Applicant, is obvious to one of ordinary skill in the art.

Regarding claim 7, analogous argument applies where each blade includes at least one hole, as argued above with respect to claim 6. Accordingly, Applicant respectfully believes that the rejection of claims 6 and 7 has been overcome, and therefore, the rejection of those claims should be withdrawn.

CONCLUSION

In view of the above remarks, Applicant respectfully requests withdrawal of all rejections and allowance of the claims pending in the application. The Examiner is invited to telephone the undersigned Applicant's Attorney to facilitate advancement of the present Application.

Respectfully submitted,



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